

## “TRADER” SERVICE SHEET

795

# ALBA 461

and 473 A.C. SUPERHETS

H.T. current is supplied by full-wave rectifying valve (**V5, Mullard AZ31**). Smoothing by resistors **R18** and **R15** in conjunction with electrolytic capacitors **C28**, **C29** and **C25**.

## COMPONENTS AND VALUES

THE Alba 461 is a 4-valve (plus rectifier) 3-band superhet designed for A.C. mains of 200-250 V, 40.100 c/s. The 473 employs a similar chassis.

Release dates and original prices: 461, November, 1945, £16 16s plus £3 12s 3d p.t.; 473, October, 1946, £17 17s plus £3 16s 10d p.t.

## CIRCUIT DESCRIPTION

Aerial input to single-tuned circuits, which precede a triode-hexode valve (**CV1, Mullard metalized ECH35**) operating as frequency changer.

Triode oscillator grid coils **L7** (S.W.), **L8** (M.W.) and **L9** (L.W.) are tuned by **C34**. Parallel trimming by **C35** (S.W.), **C36** (M.W.) and **C10**, **C37** (L.W.); series tracking by **C11** (S.W.), **C12** (M.W.) and **C13** (L.W.). Reaction coupling by coils **L10** (S.W.), **L11** (M.W.) and **L12** (L.W.).

**E12 (L.W.V.).**  
Second valve (**V2, Mullard metallized EF39**) is a variable-mu R.F. pentode operating as intermediate frequency amplifier.

Intermediate frequency 460 kc/s.

Diode second detector is part of double diode triode valve (**V3, Mullard metallized EB633**). Audio frequency component in rectified output is developed across load resistor **R7** and passed via coupling capacitor **C21**, switch **S13** and manual volume control **R9** to control grid of triode section, which operates as A.F. amplifier. I.F. filtering in diode circuit by **C17, R6** and **C19**.

Second diode of **V3**, fed from **L16** via **C22**, provides D.C. potentials which are developed across load resistor **R12** and fed back through decoupling circuits as G.B. to F.C. (except on S.W.) and I.F. valves, giving automatic volume control. Delay voltage, together with fixed G.B. for **V1**, **V2** and **V3**, is obtained from the drop along **R8**, which is common to the cathode circuits of these three valves.

Resistance-capacitance coupling by **R10**, **C24** and **R13**, between **V3** triode and pentode output valve (**V4**, **Mullard EL33**).

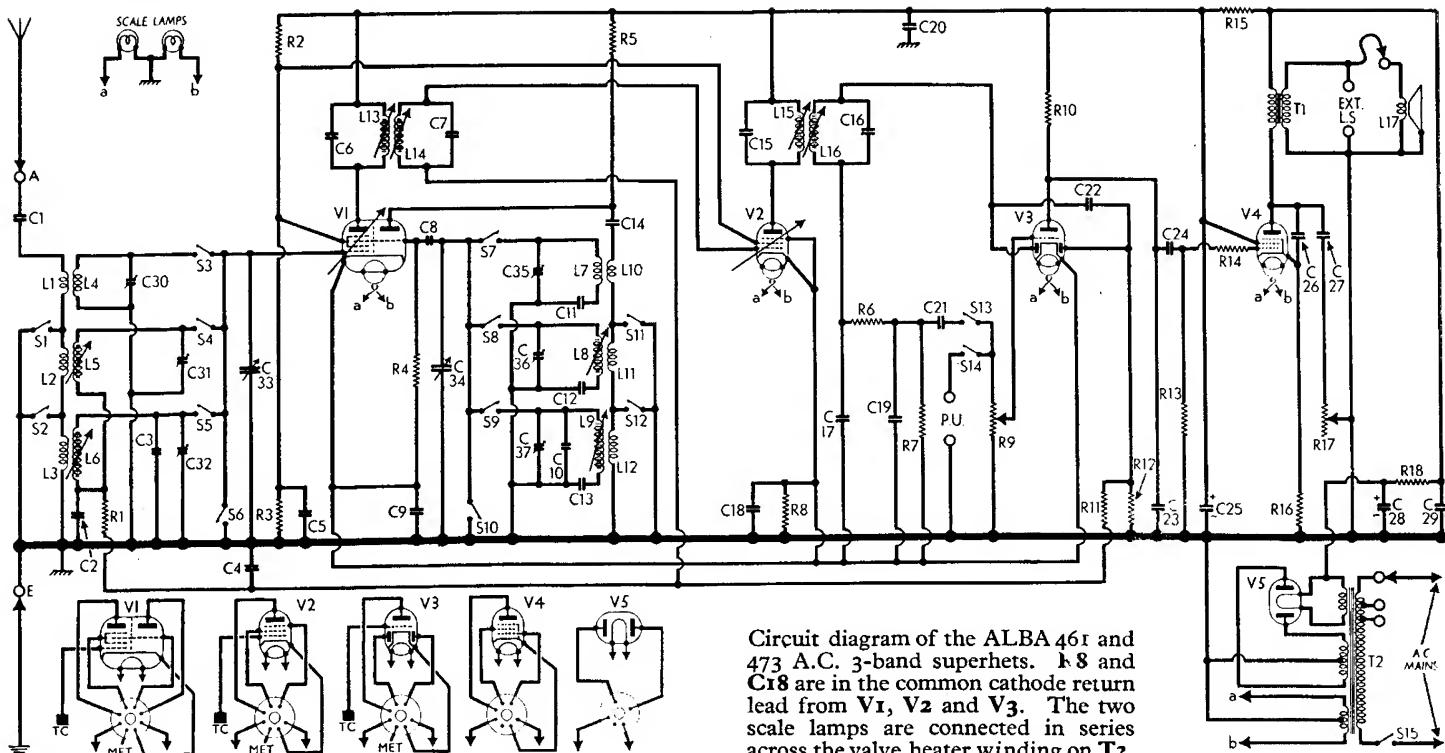
CAPACITORS		Values ( $\mu$ F)	RESISTORS.		Values (ohms)
C1	Aerial series capacitor	0.0002	R1	V1 hex. C.G. decoupling	250,000
C2	V1 hex. C.G. decoupling	0.05	R2	V1, V2 S.G.'s H.T. feed	22,000
C3	Aerial L.W. fixed trimmer	0.000056	R3	{ potential divider	33,000
C4	A.V.C. line decoupling	0.05	R4	V1 osc. C.G. resistor	47,000
C5	V1, V2 S.G.'s decoupling	0.1	R5	V1 osc. anode H.T. feed	27,000
C6	1st I.F. transformer fixed {	0.0001	R6	I.F. stopper	47,000
C7		0.0001	R7	V3 signal diode load	470,000
C8	tuning capacitors	0.000047	R8	V1, V2, V3, fixed G.B. resistor	150
C9	V1 osc. C.G. capacitor	0.1	R9	Manual volume control	1,000,000
C10	V1 cathode by-pass	0.000056	R10	V3 triode anode load	47,000
C11	Osc. L.W. fixed trimmer	0.0056	R11	A.V.C. line decoupling	1,000,000
C12	Osc. circ. S.W. tracker	0.000575	R12	V3 A.V.C. diode load	1,000,000
C13	Osc. circ. M.W. tracker	0.0002	R13	V4 C.G. resistor	5.0,000
C14	Osc. circ. L.W. tracker	0.0001	R14	V4 grid stopper	47,000
C15	V1 osc. anode coupling	0.0001	R15	H.T. smoothing resistor	2,000
C16	2nd I.F. transformer fixed {	0.0001	R16	V4 G.B. resistor	150
C17		0.0001	R17	Variable tone control	50,000
C18	I.F. by-pass	0.5	R18	H.T. smoothing resistor	1,000
C19	V1, V2, V3 cathode by-pass	0.0001	OTHER COMPONENTS		Approx. Values (ohms)
C20	I.F. by-pass	0.1	L1	Aerial S.W. coupling coil	0.2
C21	H.T. circuit R.F. by-pass	0.005	L2	Aerial M.W. coupling coil	0.8
C22	A.F. coupling to V3 C.G.	0.0002	L3	Aerial L.W. coupling coil	62.0
C23	V3 A.V.C. diode coupling	0.0002	L4	Aerial S.W. tuning coil	0.1
C24	I.F. by-pass	0.0002	Continued overleaf		
C25*	A.F. coupling to V4 C.G.	0.01			
C26	H.T. smoothing capacitor	16.0			
C27	Fixed tone corrector	0.005			
C28*	Part variable tone control	0.05			
C29*	H.T. smoothing capacitors {	8.0			
C30†		16.0			
C31†	Aerial S.W. trimmer	0.00005			
C32†	Aerial M.W. trimmer	0.00005			
C33†	Aerial L.W. trimmer	0.00005			
C34†	Aerial circuit tuning	0.0005			
C35†	Osc. circ. S.W. trimmer	0.00005			
C36†	Osc. circ. M.W. trimmer	0.00005			
C37†	Osc. circ. L.W. trimmer	0.00005			

\* Electrolytic. † Variable. ‡ Pre-set.

*Continued overleaf*

Approx.  
Values  
(ohms)

U.S.W. tuning con ...



Circuit diagram of the ALBA 461 and 473 A.C. 3-band superhets. **L8** and **C18** are in the common cathode return lead from **V1**, **V2** and **V3**. The two scale lamps are connected in series across the valve heater winding on **T2**.

OTHER COMPONENTS <i>Continued</i>			APPROX. VALUES (ohms)
1.5	Aerial M.W. tuning coil	...	3.0
1.6	Aerial L.W. tuning coil	...	17.5
1.7	Osc. S.W. tuning coil	...	0.2
1.8	Osc. M.W. tuning coil	...	1.8
1.9	Osc. L.W. tuning coil	...	4.8
1.10	Osc. S.W. reaction coil	...	0.4
1.11	Osc. M.W. reaction coil	...	1.1
1.12	Osc. L.W. reaction coil	...	2.4
1.13	1st L.F. trans.	{ Pri.	7.0
1.14		{ Sec.	7.0
1.15	2nd L.F. trans.	{ Pri.	9.0
1.16		{ Sec.	9.0
1.17	Speaker speech coil	...	1.75
T1	Output trans.	{ Pri. ... Sec. ...	340.0
			0.2
			20.0
T2	Mains trans.	{ Heater sec. Rect. heat. sec. H.T. sec., total	0.1 0.2 460.0
81-814	Waveband switches	...	—
815	Mains switch, ganged	R17	—

## VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 227 V, using the 230 V tap on the mains transformer.

The receiver was tuned to the lowest wavelength on the M.W. band and the volume control was at maximum, but there was no signal input. Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECH35	{ 216 Oscillator 97 }	{ 1.82 3.85 }	94	1.85
V2 EF39	216	4.4	94	1.22
V3 EBC33	104	2.1	—	—
V4 EL33	260	31.0	216	3.56
V5 AZ31	280	—	—	—

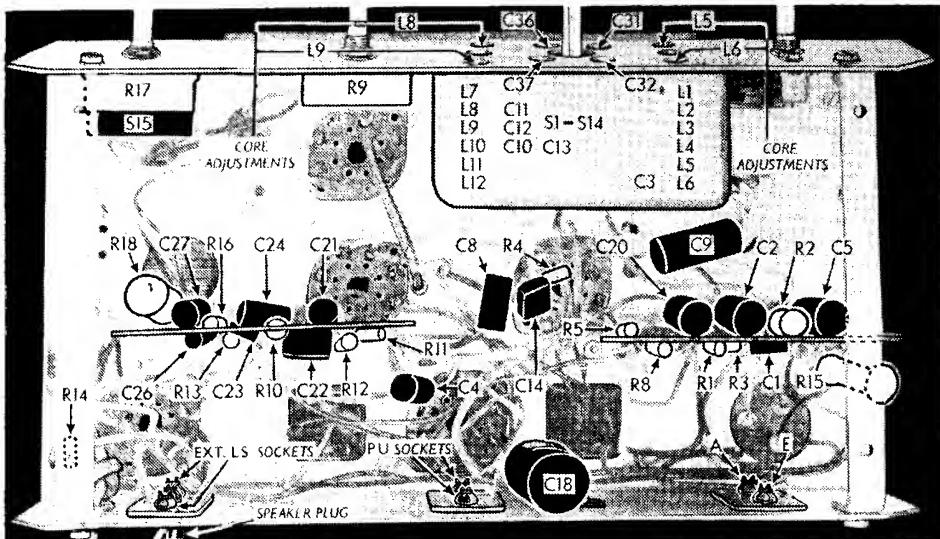
† Each anode, A.C.

## DISMANTLING THE SET

**Removing Chassis.**—This is quite straightforward, and needs no description.

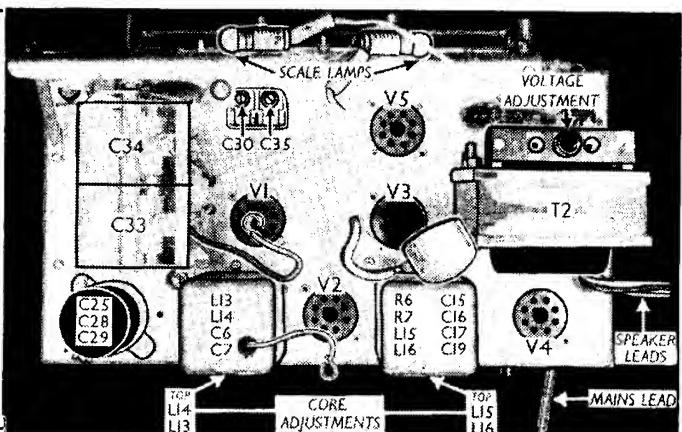
When replacing, connect the speaker leads as follows, numbering the tags on the connecting panel from top to bottom: 1, brown; 2, red; 3, white; 4, blue; 5, yellow. The transformer should be on the right of the speaker, and an earthing lead goes under a speaker fixing nut.

**Removing tuning assembly.**—Unsolder from the seven tags on the assembly the leads connecting it to chassis, also the systolex covered wire going to the right-hand tag on the volume control and the earthing lead which joins a "star" tag to the right of the assembly.



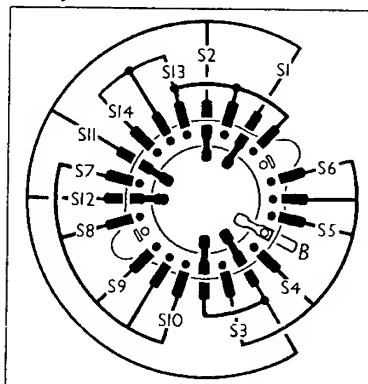
Under-chassis view. The large unit at the top is the tuning assembly.

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Plan view of the chassis. The I.F. transformer core adjustments are approximately indicated by arrows.

Switch set to S.W. and loosen the grub screw of the waveband indicator operating arm, and slide the arm off the waveband switch spindle; remove four cheesc-head screws (with lock washers) securing the tuning assembly to the front chassis member, and lift out the assembly.



The switch unit, seen from the rear.

When replacing, the heads of two trimmers (C30, C35) should project through the hole in

the chassis deck. Connect the leads to the tuning assembly as follows, numbering the tags from left to right: 1, to **C8** and **C34**; 2, to **C14**; 3, screened lead to "live" P.U. socket; 4, screened lead to **C21**; 5, to **C1**; 6, to the junction of **R1** and **C2**; 7, to **C33**. The systoflex covered lead emerging from the front of the assembly goes to the right-hand tag on the volume control, and the braided wire earthing lead should be soldered to the "star" tag to the right of the tuning assembly.

Switch	S.W.	M.W.	L.W.	Gram.
S1	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
S2	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
S3				
S4				
S5				
S6				
S7				
S8				
S9				
S10	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>
S11				
S12				
S13				
S14				

## CIRCUIT ALIGNMENT

**I.F. Stages.** Connect signal generator leads to control grid (top cap) of **V1** and chassis, turn the volume control to maximum, feed in a 460 kc/s (652.1m) signal, and adjust the cores of **L13**, **L14**, **L15** and **L16** for maximum output.

**R.F. and Oscillator Stages.**—With the gang at maximum, pointer should coincide with the high wavelength ends of the scales. Transfer signal generator leads, via a suitable dummy aerial to **A** and **E** sockets.

**M.W.**—Switch set to M.W., tune to 215m on scale, feed in a 215m (1,396 kc/s) signal, and adjust **C36**, then **C31** for maximum output. Tune to 500 m on scale, feed in a 500m (600 kc/s) signal, and adjust the cores of **L8** and **L7** for maximum output. Check **L8** at 350m (857 kc/s) for correct calibration, and repeat the **C31**, **C36** adjustments if necessary.

**S.W.**—Switch set to S.W., tune to 18m on scale, feed in an 18m (16.67 Mc/s) signal, and adjust **C35**, then **C36**, for maximum signal.

adjust **C35**, then **C30**, for maximum output. **L.W.**—Switch set to **L.W.**, tune to 1,000m on scale, feed in a 1,000m (300kc/s) signal, and adjust **C37**, then **C32**, for maximum output. Tune to 1,900m on scale, feed in a 1,900m (157.9 kc/s) signal, and adjust the cores of **L9** and **L6** for maximum output. Check the settings of **C32**, **C37**.